Method of selection of milk in milking parlour has milk flow in measuring chamber and monitor for particulates adjacent to floor of chamber

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Abstract of **DE10131781**

The method of selection of milk in a milking parlour has the milk flow in a measuring chamber (3) measured by a detector (6). Part of the milk in the chamber is decanted and the area of the floor (25) surface of the chamber is monitored. A monitor value is produced and independence of the values the milk flow to the collecting container is allowed or not. Claims include a machine for carrying out the method.

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The item of the invention refers to a method as well as to an apparatus for the selection of milk with the machine-operated milking.

Raw milk is an important food and an important raw material for food industry. For the protection of the consumer and to the technical processing ability raw milk must meet both national and international quality requirements.

Raw milk may not exhibit abnormal sensory features after 3 of the milk regulation, so that in accordance with plant 3 of the milk regulation persons, who milk, who have first milk jets from each teat separately to milk and by testing of their appearance of the perfect nature of the milk from each animal to convince themselves. The first milk jets may not be brought to the milk regulation in accordance with 18 into traffic.

Animals, of which milk is won as food, may not suffer after plant 1 of the milk regulation from a recognizable inflammation of the Euters. Appropriate legislation (RL92/46 EEC, appendix A and RL89/362 EEC, appendix chapter III) comes likewise within the European union to the application.

Signs of a recognizable inflammation of the Euters (clinical Mastitis) are and. A. the presence of flocks, consisting of fabric remainders, fibrin, cell December rite, Blutkoagula and Mastitiserregern in the Gemelk of individual gland complexes, Euterviertel and/or. Euterhälften and in the Gesamtgemelk of individual animals.

Macroscopically recognizable flocks know a size of approx. 100 mu m up to several millimeters exhibit. Collecting such flocs in certain Gemelksfraktionen, preferably the pre and Anfangsgemelken, can lead to a very viscous secretion of several Millilitern. Such flocs are quality-determining particles, which determine and if necessary exclude the negotiability of raw milk.

Pre and Anfangsgemelke can contain particles, which are not sign of a recognizable Entründung of the Euters beside flocs also, but when foreign particles come from the environment. Such particles can arrive by insufficient cleaning measures at the Euter of the animal into the milk. Here it can concern for example hair, dust, straw particle, sawdust and hay remainders.

In the practice the differentiation between qualtitätsbestimmenden particles and foreign particles is by testing of their appearance without considerable difficulties possible, there itself the particles and. A. with respect to colour, mould, value, structure and pattern mostly substantially from each other differentiate.

With conventional milking technology the short milk hoses usually flow in a piece of milk collection, by where the milk in a long milk hose is supplied the Milchleitung and finally in a milk collection tank caught, cooled and stored. The milk is then processed in appropriate specialized enterprises.

With automatic milking procedures regularly the short milk hoses and a piece of milk collection are missing, so that the milk of each functional milk gland is supplied separately in a milk hose of the Milchleitung and finally caught, cooled and stored in a milk collection tank.

Gemelke of several, parallel milked animals mix themselves in the Milchleitung. Into the milk collection tank all Gemelke of the animals of a herd arrives, so that the caught milk becomes designated as herd collecting milk.

The milk of animals with recognizable Euterentzündung is to be ermelken separately, whereby usually in conventional milking technology
▲ top the long milk hose before inlet into the Milchleitung a collection container (so-called. ?Can? is inserted), which the sense-due changed milk is supplied. The Gemelk is afterwards rejected.

As decision basis a preceding testing of the appearance serves separated won Vorgemelks by the Melker.

In practice the danger exists that the visual sense maturity examination will often omit, since it is generally secondarycomplex and thus uneconomic. Mechanisms, which make the collection possible of flocs, are to be controlled by the Melker, what is likewise connected with a not insignificant expenditure of time.

With automatic milking procedures the testing of the appearance is separate won Vorgemelks by the Melker not possible. Those so far admits become technical apparatuses works insufficiently, so that it cannot be ensured that the milk won with the automatic milking corresponds to the national and international quality regulations.

By US 4.376.053 a method and an apparatus are well-known to the determination of particles in the milk. The apparatus exhibits a filter unit, which has a filter housing with an outward open gap. The filter housing is a filter element arranged that in the suitable framework kept becomes basic from a sealing member. For examination, whether in the Gemelk particles were contained it is taken out, the filter element of the filter housing and submitted of an optical testing. In order that the Milchleitung is not blocked by a clogged filter element and lead the vacuum at the milking witnesses not is lost, to a waste the milking witness can to guarantee what, is parallel to the flow path a bypass passage intended.

An advancement of the filter unit described by US 4.376.053 is by the WHERE 00/67559 A1 well-known. After this document an apparatus is suggested for automatic milk segregation with the machine-operated milking. The device points a measuring device to to controlling of the won milk, a valve mechanism with a milk course and several milk exits as well as a catch mechanism for the optional shut-off position of the milk exits and for optional leading of the milk stream in one of several routings. The valve mechanism becomes actuated by control means. The testing takes place via a detection by means of a particle detecting mechanism. In the flow path of the milk a filter element is arranged, which is detected by the particle detector mechanism.

The determination of the flocs and/or. Particle must take place animal-individually. This presupposes that a cleaning of the Filterelementes can take place reliably and surely, without a contamination of following milk stream with particles of preceding Gemelke takes place. The cleaning of the Filterelementes with by the WHERE 00/67559 the A1 it admitted apparatus effected by the fact that the particles lying on

- the filter element are replaced by rotation of the Filterelementes with the help of the milk stream. Alternatively for this the cleaning of the Filterelementes can take place via a ?way Splash?. Here the danger exists that from the milk stream following particle can to settle on the rear side of the Filterelementes and lead thus to incorrect measuring. There is also the danger that particle-free milk stream with quality-reducing particles of previous milking are contaminated.

By the WHERE 99/31966 A1 is a method and to separate an apparatus from milk admits. After this method a first part of the ermolkenen milk from the milk stream is separated and rejected. Afterwards a milk sample becomes from the milk stream pulled and afterwards analyzed. In dependence of the result of the analysis it is decided whether the milk stream is led or rejected into the milk collection tank for usable milk.

After suggestion of the WHERE 99/31966 A1 only a second Gemelksfraktion of an analysis is submitted, the danger exists that the diagnostic security of a sense maturity examination sinks substantially.

Of it outgoing the current invention the objective is the basis to indicate a method and a device by which with simple means the diagnostic security of a sense maturity examination can be increased. A further goal of the invention is it to guarantee that a contamination of following Gemelke is avoided by particles from preceding Gemelken.

This object becomes according to invention by a method with the features of the claim 1 and/or. by an apparatus with the features of the claim 15 detached. Favourable training further and embodiments of the method and/or. the device are item that dependent claims in each case.

After a thought according to invention a method is suggested for the selection by milk, with which a given milk volume of a milk stream is led into a measurement chamber with at least a detector unit. Are in the milk volume, which is examined in the measurement chamber, particles, then these settle in the bottom portion of the measurement chamber. It takes place a decanting of the milk which is in the measurement chamber, so that the aqueous phase of the milk parliamentary group led into the measurement chamber is derived. Flocs are and/or in the first parliamentary group of a milk stream. Particles contain, then these collect themselves off in the bottom portion of the measurement chamber. After the decanting a detection takes place at least area of the bottom surface of the measurement chamber. In dependence of the result of the evaluation of the detection the milk stream is led or rejected either to the collection container for usable milk.

According to invention a higher diagnostic security is reached by this procedure guidance. The moreover this procedure guidance has the advantage that without filter elements one does, which vouch the danger of the contamination of following milking stream.

In order to avoid that the decanting and/or the detection are affected by the following milk stream, it plans a favourable further training of the method that the milk stream is led past at least during the decanting the measurement chamber.

The measurement chamber exhibits preferably at least one filling condition sensor, which is connected with a control unit. It is examined by the filling condition sensor whether in the measurement chamber the given milk volume is. If the given milk volume was reached, then the milk stream is led past the chamber. Instead of a filling condition sensor for the verification of the given milk volume also a determination of the milk volume can take place on the basis measuring data, in particular the velocity of flow of the milk.

After a further favourable formation of the method it is suggested that the milk stream is led into a Milchleitung. The measuring chamber is connected by a feed line with the Milchleitung, whereby the feed line exhibits a valve unit, by which the flowtechnical connection between the Milchleitung and the measurement chamber at least during the decanting is interrupted.

It is guaranteed by this measure that the milk volume which is in the measuring chamber is not affected by the following milk stream, so that a relatively quick calming of the milk volume which is in the measuring chamber is reached, whereby the particles finding in the milk volume can set off rapidly at the floor of the measurement chamber.

The milking procedure as such is a continuous event and can therefore not for the decanting or for the detection be interrupted. Around the milk losses if possible small it will keep suggested that the milk stream is led at least during the decanting into a buffer. After evaluation of the detection in dependence evaluation result the milk from the buffer is led either into a wire for usable milk or into a wire for non-usable milk.

After a still further favourable further training of the method it is suggested that the milk stream before the measurement chamber in a calming distance is calmed down. It is reached by this measure that a settling of the particles in the measurement chamber, which are in the milk stream, is accelerated.

With the decanting of the milk which is in the measurement chamber, this is led over an edge of an outlet. For this it is suggested that the spacing and/or the ply between the Loden of the measuring chamber and an edge of an outlet are relatively to each other changeable and/or. are. Here the possibility exists that the floor of the measurement chamber stationarily, while the edge is situation-variable. The change of position of the edge takes place via suitable means, which are connected with a control unit. By the control unit the spacing and/or the ply between a floor of the measurement chamber and an edge of the outlet can become controlled relatively to each other. The change of the distance and the ply can take place continuous or discontinuous. Here the decantation procedure can be accomplished in dependence by the calming degree of the milk volume in the measurement chamber differently quick. Is favourable, if at the beginning of the decantation procedure the velocity of flow of the milk from the measurement chamber is relatively large and this decreases to the end of the decantation procedure.

After a still further favourable embodiment of the method according to invention it is suggested that after the detection and preferably after an emptying of the measurement chamber a cleaning procedure of the measurement chamber takes place. Thereby it is to be guaranteed that a contamination of following milk stream does not take place.

A cleaning procedure is preferential, with which at least a cleaning agent is led by the measurement chamber. During the cleaning procedure at least the measurement chamber is final in relation to the milk stream. Because the measuring chamber is locked in relation to the milk stream is guaranteed, that a cleaning agent, which is passed through the measuring device can penetrate not into milk-prominent wires. By the cleaning agent the flocs deposited at the bottom of the chamber become and/or. Particle detached and from the measurement chamber out-carried.

After a still further favourable embodiment it is suggested that after that at least cleaning agent air is passed through the measurement chamber. Here air is led by means of a blower mechanism, which is released by a filter from dust particles, into the measuring device, in order to release the elements of the measuring device coming with liquids into contact from liquid arrears, in particular from cleaning agent arrears. Here a procedure guidance, with which air is warmed up before in the blower mechanism, is preferred in particular on a temperature of at the most 45 DEG C. Higher temperatures are possible, it exist however the danger the fact that the physicochemical properties of milk remainders change in such a way that this durably to elements coming with fluids into contact remains.

In accordance with a still further favourable carrying out the method it is suggested that the cleaning success of the measurement chamber

is examined by detection and in dependence by the evaluation result the cleaning be repeated can. It was stated that the cleaning was incomplete, then the cleaning procedure is repeated until desired cleaning success occurs. The time interval available for it is limited by the milking duration of the animal and the time, until a following animal is milked.

After a still further favourable embodiment of the method it is suggested that the detection takes place optically, in particular with technical mechanisms of picture-giving methods. Preferably process engineering/technical elements of the photo optics for the detection are suitable. For the increase of the measuring accuracy picture-giving methods can around further methods, which suggest the Eutergesundheitsstatus of the animal like milk temperature, electric conductivity, milk river rate, ion concentrations (z. B. determined by ion-selective electrodes) in milk, concentration regulations of further milk contents materials such as Ketonkörper, Laktat, Laktatdehydrogenase, NAGase (z. B. by biosensors), for the optimization of the measuring accuracy to be determined supplemented.

The evaluation of the detection effected preferably by at least one image analysis program and/or at least one picture working on program, which are suitable/are/, by at least one algorithm in addition, which can be determined, which is suitable, by elements of the Fuzzy logic which can be determined to be supplemented and/or interconnected.

The apparatus according to invention for the selection of milk exhibits a Milchleitung, which is connected with a measuring device. The measuring device exhibits a measurement chamber with at least a detector unit. With the detector unit a control unit is connected. The measuring chamber of the apparatus according to invention is a component of a decanter. Downstream the measuring device with the device according to invention a valve mechanism controllable by the control unit intended, by which in dependence by the result a detection a wire for a usable milk or a wire for a non-usable milk is released.

Because the measuring chamber is a component of a decanter is done, without filter elements, which are problematic with the cleaning. The moreover with simple means it is guaranteed that a reliable evaluation of the detection takes place, so that the diagnostic security is continued to increase.

In accordance with a favourable embodiment of the apparatus suggested that in the Milchleitung a flow guidance body is intended, by which a milk stream is hang-led to the measuring device. The formation of a flow guidance body of the situation-variable in the Milchleitung arranged is preferential is. The flow guidance body is movable thereby and can in the Milchleitung different positions take, so that the flow resistance can be different. It is preferably temporarly and into the Milchleitung at least partly importable.

In accordance with a further favourable embodiment of the apparatus it is suggested that between the Milchleitung and the measuring device a reservoir is intended. This reservoir can serve the current before the entrance of the milk of the measurement chamber for the calming.

In accordance with a still further favourable embodiment of the apparatus it is suggested that downstream the measuring device a buffer is intended, which is connected with the Milchleitung, whereby after evaluation of the detection in dependence by the evaluation result milk from the buffer is led either into a wire for usable milk or into a wire for non-usable milk.

In accordance with a further favourable embodiment of the apparatus it is suggested that the measuring device is connected by a feed line with the Milchleitung and in the feed line a valve unit arranged. The milk stream in the Milchleitung can be led past by this measure the measuring device. If it concerns with the valve unit a multi-path unit, then this wire for a cleaning agent can be connected. It is guaranteed by an appropriate circuit of the valve unit that during a cleaning procedure no cleaning agent arrives into the Milchleitung.

The device is preferably in such a way trained that the measuring device exhibits an expiration mechanism, which has a movable catch body with an expiration edge, so that with a movement of the catch body the expiration edge accomplishes an essentially vertical change of position. A further training of the apparatus is preferential, with which the expiration mechanism is connected with the control unit, so that the course of motion of the catch body becomes controlled by the control unit.

After a still further favourable embodiment of the device it is suggested that in the measuring chamber the detector unit opposite area is intended, which is movable from horizontals. This has the advantage that in dependence of the angle of inclination way oversupplies a down-sunk particle is prevented. This can be achieved also by the fact that the measurement chamber is movable and/or the detector unit opposite area an essentially horizontal running axis. To the one it is reached by this favourable embodiment of the device that way oversupplies a down-sunk particle is prevented and facilitated on the other hand the cleaning, if the measurement chamber is swivelled and/or the detector unit opposite area into an opposite direction.

In accordance with a still further favourable embodiment of the device it is suggested that the measuring chamber exhibits a detector unit opposite area and the detector unit and the area relatively to each other movable are. Thereby the distance between the detector unit and the opposite area for a detection can be changed.

Is preferably by a support, which is arranged at the measuring chamber soil, formed for the detector unit opposite area of the measurement chamber. Preferably the support is movable. This covers also that the cover can be changeable in its angle of inclination, so that the drain of an aqueous phase of the milk is facilitated and/or the Abschwemmen of the dropped particles is prevented. The moreover the support can be more rotary, in order to reach a complete detection.

Preferably the support is in such a manner trained that it is so structured in its surface finish that it is suitable, to obstruct down-sunk particles from a Abschwemmen to. Furthermore the attachment can exhibit a dark color impression or a bright color impression or in one geometrical arrangement of fields with a dark and a bright color impression, which can be determined, in order to make a contrast possible to the color impressions deposited particles.

After a still further favourable embodiment of the apparatus it is suggested that this exhibits a cleaning device. The cleaning arrangement preferably exhibits a wire for a cleaning agent. The measuring device is in the flow path of the cleaning agent arranged. In the area before and behind the measuring device in each case a valve unit is intended. These valve units are connected with the control unit, so that the measuring device is connected either with the Milchleitung or the wire for a cleaning agent or locked completely by all routings. It is guaranteed by this favourable formation of the device that on the floor of the measuring chamber or on the support flocs and/or. Particles into the Milchleitung do not arrive. It is further guaranteed that the detection is disturbed by the measurement chamber not flowing through milk. The moreover a contamination of the milk-prominent wires becomes into a cleaning agent and/or. a cleaning fluid prevented and thus a physical separation between cleaning agent-prominent parts and the milk-prominent parts during a cleaning procedure reaches.

After a still further favourable formation of the device it is suggested that the device exhibits a blower mechanism, which is connected with the measuring device. An air flow is led by the blower mechanism by the measuring device. The blower mechanism can exhibit a heating mechanism, so that the air flow is led by the measuring device. The measuring device is separable in relation to the blower mechanism by a valve mechanism.

Further items and features of the invention are described on the basis the embodiment represented in the design.

Show:

Fig. 1 schematic an apparatus for the selection of milk,

Fig. 2a-2r snapshots during an operation of the device after Fig. 1.

Fig. 1 points schematically a preferential embodiment of an apparatus to the selection of milk. The apparatus covers a Milchleitung 1. The Milchleitung 1 is connected by a feed line 18 of the measuring device 3.

Downstream the feed line 18 the Milchleitung 1 exhibits a valve mechanism 12, which becomes 10 controlled by a control unit. By the valve mechanism 12 the milk stream is not led in dependence by the result of a detection into a wire 13 for usable milk or into a wire 14 for usably milk.

Fig. 1 shows that in the Milchleitung 1 a flow guidance body is 2 arranged. In the transition area between the Milchleitung 1 and the feed line 18 a reservoir 22 is intended.

In the represented embodiment the flow guidance body 2 projects radially inward from a wall of the Milchleitung 1 these partial into the reservoir 22. In the represented embodiment the flow guidance body 2 at the Milchleitung arranged is stationary. Alternatively the flow guidance body can be trained 2 movable. It can be into the Milchleitung 1 in and executable. This can be connected by an appropriate actuator with the control unit 10, so that the flow guidance body 2 in dependence of the procedure conditions changes the ply. Preferably the flow guidance body 2 is in such a way trained that it offers 1 flowing milk a different flow resistance in dependence of its ply of the Milchleitung.

Between the reservoir 22 and the measuring device 3 a valve unit 17 is intended. In the represented embodiment the valve unit 17 signal lines over not represented is connected with the control unit 10.

The measuring device 3 exhibits a measurement chamber 4, which is connected with the feed line 18. The measuring device 3 exhibits a detector unit 6. With the detector unit 6 it concerns in the represented embodiment an optical detector unit. Beside the detector unit 6 lighting units 7 are represented.

The measuring device 3 exhibits preferably at least one filling condition sensor, 9. In the represented embodiment two filling condition sensors 8, 9 are intended. The filling condition sensors 8, 9 are connected signal lines over not represented with the control unit 10. The filling condition sensor 9 detects the highest filling conditions in the chamber 4. The filling condition sensor 8 detects the lowest filling conditions in the measurement chamber 4. The measuring chamber 4 is a component of a decanter.

The measuring device 3 exhibits an expiration mechanism 11, in the milk from the measurement chamber 4 to run off can. The expiration mechanism 11 exhibits a movable catch body 23 with an expiration edge 24. The catch body 23 is movable trained, so that the expiration edge 24 accomplishes an essentially vertical change of position. The equipment 11 is connected with the control unit 10.

In the represented embodiment a support is 5 arranged on floor 25 of the measurement chamber 4. The support 5 is essentially evenly and horizontal positioned. The floor 25 of the measurement chamber is hang-bent for expiration execution 11. The support 5 partly covers the floor 25. It is positioned opposite-putting the detector unit 6.

Fig. an output configuration of the apparatus points 2 to the selection of milk.

In this output constellation the valve mechanism is 12 closed, so that a fluid-technical connection between the Milchleitung 1 and the wire for non-usable milk is interrupted opened and the connection between the Milchleitung 1 and the wire 13 for usable milk.

The valve unit 17 releases the feed line 18, as to milk from the Milchleitung the 1 over the feed line 18 at the measuring device 3 to arrive can, as this schematically in the Fig. 2a is represented. The milk anflutende in the Milchleitung 1 is derived by the flow guidance body 2 into the reservoir 22 and from there out into the wire 18.

The filling conditions within the measurement chamber 4 are detected by the filling condition sensors 8, 9. If the filling condition sensor 8 detected minimum filling conditions, this filling condition sensor sends a signal A to the control unit 10, like this in the Fig. 2C schematically illustrated is. By the control unit 10 over a signal B the valve unit 17 is headed for. It causes a shutter, so that the milk stream no more into the feed line 18 arrive can, but far into the Milchleitung 1 is led. The milk flows over the wire 14 for non-usable milk and is rejected.

The volume of the measurement chamber 4 is preferably so limited that the measuring chamber can also take up itself after actuation of the valve unit 17 18 milk volumes finding in the valve unit 17 and the feed line.

Fig. 2d shows that the milk stream of the first Gemelksfraktion filled the measurement chamber 4 completely and from the filling condition sensor 9, which recognizes the maximum filling conditions a signal C to the control unit 10 sends. By a signal D the control unit 10 heads for the expiration mechanism 11.

Becomes the catch body 23, with which it concerns a cylindric catch body, which has an opening 26, headed for. The catch body 23 is rotated against the clockwise direction, so that the opening 26 into a flowtechnical connection with the measurement chamber 4 arrives. The aqueous phase of the milk parliamentary group caught in the measuring chamber 4 flows thereby over the expiration edge 24 into an expiration 19. This becomes in Fig. 2e and 2f represented. The expiration 19 is only schematically illustrated ones.

The decanting of the milk from the measurement chamber 4 leads to a decrease of the fluid level in the measurement chamber 4. This is detected by the filling condition sensor 9. The sensor 9 sends a signal E into the control unit 10 (Fig. 2g). The control unit 10 activates the lighting unit 7 and the detector unit 6 by the signals F and G.

The lighting unit 7, which can contain several shining means, lights up the support of the measuring chamber soil 25 with the particles dropped to it 21, while the detector unit 6 the surface of the support 5 with the particles present at it 21 detects itself.

The information from the detection as signal H1 to the control unit 10 are led, which does not change the valve position of the valve mechanism 12 due to the detected quality-determining particles 21 (c1), so that as quality-reduced milk stream further into the conduit the 14 for non-usable milk one exhausts.

With the signal J the control unit 10 heads for a valve unit 16 of a cleaning device 20. A cleaning agent flows out of a line 15 for a cleaning agent into the measuring device 3, like it into the Fig. 2j schematically illustrated is.

During the milking procedure, with which a milk stream flows by the Milchleitung 1, becomes, as in the Fig. 2C schematically illustrated, the measuring device 3 of a cleaning agent from the line 15 for a cleaning agent flows through and the particles 21 replaced and delivered. The cleaning procedure is recognized by the level of liquid sensor 9 for the maximum filling conditions. The level of liquid sensor 9 sends a signal L to the control unit 10, which thereupon the valve unit 16 by a signal M arranges to terminate by sealing of the wire for a cleaning agent the cleaning procedure.

The entire cleaning agent flows off over the expiration 19. If necessary the not represented equipment a feed takes place from air to the

measuring device 3.

By the level of liquid sensor 8 the completion of the cleaning procedure is announced over the signal N to the control unit 10, thereupon by the signals Q and P zumindestens a lighting unit 7 and the detector unit 6 activates. The detector unit 6 examines cleaning success. The detector unit 6 supplies a signal Q, as in the Fig. 2n suggested, to the control unit. This signal Q is evaluated and specified whether the cleaning procedure is to be repeated or, as in Fig. 2n represented, successful was and therefore the expiration mechanism 11 over the signal R into the starting position to be brought can.

An end of the milking procedure is conveyed to the control unit 10 a signal 5 that for the example by a milk river recognition, which is not represented it can be sent. Due to the detection by flocs now the Milchleitung 1 before the next milking procedure is to be cleaned. The control unit 10D sends a signal T to a cleaning device for the Milchleitung, z. B. an intermediate flushing 20, so that the Milchleitung 1 can be released from quality-reducing particles, like this in the Fig. 2o and 2p are represented.

After the cleaning of the Milchleitung the entire system is available in the further event.

The Fig. 2q shows the snapshot of a detection of the surface of the support 5 by the detector unit 6. The detector unit 6 supplies a signal H2 to the control unit 10. The information content of the signal H2 promises the information that no flocs and/or. Particles detected are. Over the signal K2 thereupon the valve mechanism 12 arranges to lock the wire for the non usable milk and to open the wire 13 for usable milk, so that as qualitatively perfect recognized milk into the milk collection tank can be led, like this schematically in the Fig. 2r is represented.

Reference symbol list
1 Milchleitung
2 flow guidance bodies
3 measuring device
4 measurement chamber
5 support
6 detector unit
7 lighting unit
8 filling condition sensor
9 filling condition sensor
10 control unit
11 expiration mechanism
12 valve mechanism
13 wire for usable milk
14 wire for non-usable milk
15 wire for a cleaning agent
16 valve unit
17 valve unit
18 feed line
19 expiration
20 cleaning device
21 flocs and/or. Particle
22 reservoir
23 catch bodies
24 expiration edge
25 floor
26 opening

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1. Method for the selection of milk, with that
a given milk volume of a milk stream into a measurement chamber (4) with at least a detector unit (6) is led,
a decanting at least a part itself of the milk and thereafter, finding in the measurement chamber (4)
a detection at least an area of a bottom surface (25) of the measurement chamber (4) takes place,
whereby an evaluation of the detection takes place and in dependence from the evaluation result the milk stream either to the collection container for usable milk is led or rejected.

2. Process according to claim 1, with which the milk stream is led past at least during the decanting at the measurement chamber (4).

3. Process according to claim 1 or 2, with which the milk stream in a Milchleitung (1) is led, which is connected by a feed line (18) with by the measuring chamber (4), whereby in the feed line (18) a valve unit (17) is arranged, by which a flowtechnical connection between the Milchleitung (1) and the measurement chamber (4) at least during the decanting is interrupted.

4. Process according to claim 2 or 3, with which the milk stream is led at least during the decanting into a buffer and led after evaluation of the detection in dependence by the evaluation result from the buffer either into a wire (13) for usable milk or into a wire (14) for non-usable milk.

5. Process according to one of claims 1 to 4, with which the milk stream before the measurement chamber (4) in a calming distance is calmed down.

6. Process according to one of claims 1 to 5, with which a distance and/or the ply between the bottom surface (25) of the measurement chamber (4) and an expiration edge (24) of a drain port (26) are relatively to each other changeable.

7. Process according to one of claims 1 to 6, with which after detection and after an emptying of the measurement chamber (4) a cleaning procedure of the measurement chamber (4) is preferably accomplished.

8. Process according to claim 7, with which during the cleaning procedure at least a cleaning agent is led by the measurement chamber (4).

9. Process according to claim 8, with which after that at least a cleaning agent air is passed through the measurement chamber (4).

10. Process according to claim 9, with which air is essentially free from macroscopic particles.

11. Process according to claim 9 or 10, with which warmed up air is passed through the measurement chamber (4).

12. Process according to one of claims 7 to 11, with which the cleaning success of the measuring chamber (4) is examined by detection and in dependence by the evaluation result the cleaning be repeated can.

13. Process according to one of claims 1 to 12, with that the detection optically takes place.

14. Process according to one of claims 1 to 13 with the evaluation of the detection by at least one image analysis program and/or at least one picture working on program and/or at least one image processing program taken place, which are suitable/are/, by at least one algorithm in addition, which can be determined which is suitable, by elements of the Fuzzy logic which can be determined supplements and/or connected too.

▲ top

15. Apparatus for the selection of milk also
a Milchleitung (1),
one with the Milchleitung (1) connected measuring device (3), the one measurement chamber (4) with at least a detector unit (6) exhibits and with a control unit (10), which is connected with the detector unit (6),
characterised in that
the measuring chamber (6) a component of a decanter is, and that downstream the measuring device (3) one is intended by the control unit (10) controllable valve mechanism (12), by which in dependence by the result of a detection a wire (13) for the usable milk or a wire (14) for the non-usable milk is released.

16. Device according to claim 15, characterised in that a flow guidance body (2) in the Milchleitung (1) is intended, by which a milk stream is led to the measuring device (3).

17. Device according to claim 16, characterised in that of the flow guidance bodies (2) situation-variable in the Milchleitung (1) arranged is.

18. Device according to claim 15, 16 or 17, characterised in that between the Milchleitung (1) and the measuring device (3) a reservoir (22) is intended.

19. Device after one of the claims 15 to 18, characterised in that downstream the measuring device (3) a buffer is intended, which is connected with the Milchleitung (1), whereby after evaluation of the detection in dependence by the evaluation result milk from the buffer is led either into a wire (13) for usable milk or into a wire (14) for non-usable milk.

20. Device after one of the claims 15 to 19, characterised in that the measuring device (3) connected by a feed line (18) with the Milchleitung and in the feed line (18) a valve unit (12) arranged is.

21. Device after one of the claims 15 to 20, characterised in that the measuring device (3) an expiration mechanism (11) exhibits, which has a movable catch body (23) with an expiration edge (24), so that with a movement of the catch body (23) the expiration edge (24) accomplishes an essentially vertical change of position.

22. Device according to claim 21, characterised in that the expiration mechanism (11) with the control unit (10) is connected.

23. Apparatus after one of the claims 15 to 22, characterised in that in the measuring chamber (3) one the detector unit (4) opposite area exhibits, which is expenditure-guided from horizontals.

24. Apparatus after one of the claims 15 to 24, characterised in that the measurement chamber (4) and/or the detector unit (6) opposite area around an essentially horizontal running axis is movable.

25. Device after one of the claims 15 to 24, characterised in that the measurement chamber (4) one the detector unit (6) opposite area exhibits and the detector unit (6) and the area movable are relatively to each other.

26. Device according to claim 23, 24 or 25, characterised in that the detector unit (6) opposite area by a support (5) is formed.

27. Apparatus after one of the claims 15 to 26, characterised in that this a cleaning device exhibits.

28. Device according to claim 27, characterised in that a wire (15) for a cleaning agent is intended, which with the feed line (189 is connected.